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The time period for reply, if any, is set in the attached communication.

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE BOARD OF PATENT APPEALS
AND INTERFERENCES

Ex parte ALEXANDER RALPH BEECK, BORIS BUBLATH,
NIKOLAI-ALEXANDER DAUS, and
DIRK GOLDSCHMIDT

Appeal 2011-001785
Application 10/551,740
Technology Center 1700

Before EDWARD C. KIMLIN, PETER F. KRATZ, and BEVERLY A.
FRANKLIN, *Administrative Patent Judges*.

KIMLIN, *Administrative Patent Judge*.

DECISION ON APPEAL

This is an appeal from the final rejection of claims 17-18, and 21-28.
We have jurisdiction under 35 U.S.C. § 6(b).

Claim 17 is illustrative:

17. A process for producing a shaped object from a powder bed,
comprising:

preparing a powder bed having a first powder mix in a first region and
a second powder mix in a second region, the first and second powder mixes

differing from each other in at least one of chemical composition and powder particle size distribution;

forming a first region of the shaped object by a first laser sintering of the first powder mix;

forming a second region of the shaped object integral with the first region by a second laser sintering of the second powder mix; and

controlling a laser beam generated during the first and second laser sintering processes to produce a different sintering temperature over the first and second regions of the object creating a different degree of densification in the first and second regions of the shaped object;

wherein the forming of at least one of the first and second regions comprises controlling the respective laser sintering step to provide different material properties in the first and second regions of the shaped object.

The Examiner relies upon the following references as evidence of obviousness (Ans. 3):

Deckard	4,863,538	Sept. 05, 1989
Sachs	5,340,656	Aug. 23, 1994
Lewis	5,837,960	Nov. 17, 1998

Wolfgang Loschau et al., *Prototyping of Complex-Shaped Parts and Tools of Si/SiC-Ceramics by Selective Laser Sintering in*, *Ceramics: Getting Into the 2000's* (Part B) 567- 573(P. Vincenzini ed. 1999) (hereafter "Loschau").

Appellants' claimed invention is directed to a process for producing a shaped object from a powder bed. The powder bed has a first powder mix in a first region and a second powder mix in a second region, with the mixes differing from each other in at least one of chemical composition and particle size distribution. A first laser sinters the first powder mix to form a first region of the object, and a second laser sinters the second powder mix to form a second region of the object. The first and second laser beams are

controlled during the sintering processes to create a different degree of densification in the first and second regions of the object.

Appealed claims 17, 18, 21-26, and 28 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Deckard in view of Sachs and Lewis. Claim 27 stands rejected under 35 U.S.C. § 103(a) as being unpatentable over the stated combination of references further in view of Loschau.

Appellants do not present separate arguments for any particular claim on appeal. Nor do Appellants provide a separate, substantive argument for the Examiner's rejection of claim 27. Accordingly, all the appealed claims stand or fall together with claim 17. *See* 37 C.F.R. § 41.37(c)(1)(vii).

We have thoroughly reviewed each of Appellants' arguments for patentability. However, we are in complete agreement with the Examiner that the claimed subject matter would have been obvious to one of ordinary skill in the art within the meaning of § 103 in view of the applied prior art. Accordingly, we will sustain the Examiner's rejections for essentially those reasons expressed in the Answer.

Deckard, like Appellants, discloses a process for producing a shaped object from a powder bed by sintering the powder mix with a laser beam. As acknowledged by the Examiner, Deckard does not teach sintering a second powder mix which differs from the first powder mix to form a second region of the object to provide the first and second regions with a different density and material properties. However, we fully concur with the Examiner that the combined teachings of Sachs and Lewis evidence the obviousness of modifying the process of Deckard to arrive at the claimed process.

Sachs, like Appellants and Deckard, discloses a process for making a shaped object from a powder mix wherein two or more different types of powders can be used for different regions of the shaped object such that different physical characteristics can be obtained at such different regions (col. 11, ll. 15-22). While Sachs uses a binder material rather than a sintering laser to produce bonded powder material at selected regions, we agree with the Examiner that the collective teachings of Deckard and Sachs would have made it obvious for one of ordinary skill in the art to make a shaped object by bonding different first and second powder mixes by employing either a sintering laser or a deposited binder material.

Lewis buttresses the conclusion of obviousness by evidencing that it was known in the art to form shaped objects with regions of different density at different regions by exposing powder mixes to a laser beam whose power is controlled and varied while melting the powder (col. 22, ll. 1-5). While Appellants stress that Lewis melts but does not sinter the powder with a laser, we find that one of ordinary skill in the art would have understood that varying the laser power, as taught by Lewis, would be effective for controlling the degree of melting or sintering the powder mixture and, consequently, its density and physical properties. Appellants have not informed us of any reason why one of ordinary skill in the art would have found it unobvious to apply the principle of varying laser power to control density to the sintering process of Deckard.

Appellants contend that

even if Deckard was modified, such that the powder 22 was positioned in a first dispersion head, and a second powder was positioned in a second dispersion head, this arrangement would nevertheless fail to disclose the claimed invention, as

such an arrangement would involve: (1) successively applying a first and second powder layer into respective first and second regions, and (2) successfully applying a binder material in between each successive powder layer in the first and second region, to form the layer structure and selectively vary the material properties of the first and second regions

(App. Br. 6). Appellants maintain that modifying Deckard in such manner such that two dispersion heads were used would render Deckard unsatisfactory for its intended purpose since there is no teaching as to how to move the dispersion heads so as to not interfere with the performance of Deckard's laser. However, it is well settled that it is not necessary for a finding of obviousness under § 103 that all the elements or teachings of one reference be fully combined with those of another reference. *In re Griver*, 354 F.2d 377, 381 (CCPA 1966); *In re Billingsley*, 279 F.2d 689, 691 (CCPA 1960). Hence, it is not required that the process of Deckard be modified to include the application of binder material and, like the Examiner, we are confident that one of ordinary skill in the art would have found it obvious to properly position the location of the lasers in a modified Deckard process which applies the lasers to different powder mixes.

As a final point, we note that Appellants base no argument upon objective evidence of non-obviousness, such as unexpected results.

In conclusion, based on the foregoing, the Examiner's decision rejecting the appealed claims is affirmed.

No time period for taking any subsequent action in connection with this appeal may be extended under 37 C.F.R. §1.136(a)(1)(v).

AFFIRMED

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